

***NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 8-2003
APPLICABLE TO INSTRUCTION 10-310
FEBRUARY 19, 2003***

***Operations and Services
Marine Weather, NWSI 10-310***

MARINE WEATHER SERVICES

OPR: W/WR1x4 (T. Ainsworth)

Certified by: W/WR1 (R. Douglas)

Type of Issuance: Emergency.

SUMMARY OF REVISIONS: This directive supersedes NWS Western Region Supplement 1-2002 dated August 2, 2002 to NWS Instruction 10-310.

Signed

02/04/03

Vickie Nadolski

Date

Director, Western Region

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Appendix

A. Example

1 Criteria for High Surf Advisory according to location (Table) A-1

1. Description. Provides additional guidance and instructions for marine weather products and services including Definitions, Coastal Waters Forecasts, and Marine Weather Statements. Written instructions cannot address every situation. Operational personnel must exercise initiative and professional judgment to minimize risk to public safety and property in instances when written instructions do not provide appropriate guidance. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property will take precedence in these decision-making processes.

2. Definitions. The following definitions expand upon, or are in addition to, definitions in NWSI 10-301, Section 2.

Combined seas. The combination or interaction of wind wave and swell when the separate components are not easily distinguishable. This term will be used to describe sea state when wind speeds are gale force or higher.

Wave steepness. The ratio of wave height to wave length. This is an indicator of wave stability. When wave steepness exceeds a 1/7 ratio, the wave becomes unstable and begins to break.

Wave steepness is a derived sea state parameter routinely reported in wave summary data from National Data Buoy Center (NDBC) buoy platforms. Steepness is reported as

either "VERY STEEP," "STEEP," "AVERAGE," or "SWELL." For a given wave height, steep waves represent a more serious threat to capsizing vessels or damaging marine structures than broad swell. Steepness observed at NDBC platforms is determined by examining the *significant wave height* and the *dominant wave period* when compared to climatology.

3. Policy.

3.1 Coastal waters forecasts.

- a. Product Issuance. Western Region WFOs will issue four scheduled CWFs daily, per schedule below, and issue unscheduled update forecasts as necessary. Scheduled product issuance time will be no more than 30 minutes earlier than this schedule or more than 30 minutes after this schedule.

0300 PT; 0900 PT; 1500 PT; 2100 PT

- b. Product Format.

The Day 3 Evening period (6 p.m. to Midnight) can be specifically included at the forecaster's discretion depending on the level of threat posed to customer safety around that time period.

WFOs Los Angeles, San Francisco Bay Area, and Seattle will reference National Marine Sanctuaries in their areas of responsibility in the SYNOPSIS description line or in the areal description line of the Mass News Disseminator (MND). (See NWSI 10-302, Sec 6).

FZUS56 Kxxx (ISSUANCE DATE TIME ddhhmm)
CWFxxx

COASTAL WATERS FORECAST
NATIONAL WEATHER SERVICE (CITY)(STATE)
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

(OVERALL AREA COVERED BY THIS FORECAST - optional)

(SYNOPSIS UGC CODE)-(EXPIRATION TIME)-
.SYNOPSIS FOR (WFO MARINE AREA - optional location for including
National Marine Sanctuaries)...TEXT

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREAL DESCRIPTOR[S] - optional location for including
National Marine Sanctuaries)
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

...HEADLINE (If needed)...

.Forecast text...

\$\$

Forecaster Name or Number (Optional)

3.2 Forecast Content.

- a. 1-3 Day Forecast Periods. In addition to wind speed/direction and sea state, swell period will be included for the first 36 hours (typically the first three time periods) in most CWF zones. Wind wave period may be added when wind waves pose the most significant threat. For example, when persistent north winds blow along the west coast during the summer generating large wind waves and there is very little swell component to the sea state, wind wave period can be mentioned.

Exception: Inclusion of specific sea state conditions such as swell height, swell direction, and swell or wind wave period can be included but are not required for marine zones in Puget Sound, Strait of Juan de Fuca, San Francisco Bay, Monterey Bay, Santa Barbara Channel, and inner waters from Point Mugu to San Mateo Point to the Mexico border.

The term “combined seas” may be used to describe unusually confused seas occurring with at least gale force winds. Dominant wave period (period of waves with most energy) may be substituted for swell period when combined seas are used in the forecast.

3.3 Forecast Parameters and Elements.

- a. Wind. A single prevailing wind direction should be used, unless a wind shift is predicted during the forecast period. A small range of wind direction (e.g., 45 degrees, “W-NW”) may be used in areas affected by topography (e.g., bays, channels, etc.).
1. Significant differences between sustained winds and peak gusts (i.e., at least 15 KTS) may also be specifically stated.
 2. Keep in mind wave height is proportional to the square of the wind speed. Doubling the wind speed, for example, quadruples the range of wave heights. Large ranges in wind speed require larger corresponding ranges in wave height.
- b. Seas. Sea state may be the most misunderstood element in the marine weather forecast. Forecasters must have, and apply, an excellent understanding of the following sea state terms: significant wave height; wind wave height; swell

height; wave period; combined seas; wave steepness. Refer to 10-301 Marine and Coastal Services Abbreviations and Definitions, and Section 2 above.

- (1) Criteria for Small Craft Advisory for Hazardous Seas (SCAHS) is significant wave heights of 10 feet or higher. However, wave steepness is a better indication of hazardous sea state. Wave steepness is the ratio of wave height to wave length and is an indicator of wave stability. Experienced mariners have reported that hazardous conditions exist when wave period in seconds is less than or equal to wave height in feet (e.g., 7 feet at 7 seconds), especially when conditions are less than approximately 12 feet/12 seconds. Refer to section 2 above for additional guidance on wave steepness.
 - (2) WR offices should have local SCAHS criteria based on wave steepness, in coordination with local marine customers, and neighboring offices. WFOs will include steepness criteria in their SDM posted on the MSD web page and will inform MSD if their wave steepness criteria changes.
 - (3) Inland waters and bays exempted from having detailed seas state predictions may use a general description of sea conditions (i.e., steep, rough, choppy, etc.) when it helps convey the severity of a given situation. For these purposes, the terms “steep” and “rough” mean the period in seconds is the same as, or less than, the wave height in feet. “Choppy” is the same criteria but for wave heights of less than five feet.
- c. Visibility. Fog is the most prevalent, and potentially most hazardous, restriction to visibility affecting WR marine zones. Forecasters should make every effort to ascertain the degree and spatial extent of conditions reducing visibility to 6 NM or less, or less than 1 NM. Forecasters will not use qualitative descriptions of visibility. The term “dense fog” is defined by World Meteorological Organization (WMO) for marine weather purposes as fog reducing visibility to 1 NM or less. Therefore, “dense fog” is a quantitative description and can be used in the forecast.

3.4 Unscheduled Forecasts. As needed, add either "...UPDATED" or "...CORRECTED" to the product header whenever an unscheduled CWF is issued or when an error in the CWF is corrected, respectively. Add a short description of the updated or corrected items just below the areal header to highlight the change.

COASTAL WATERS FORECAST...**UPDATED (or CORRECTED)**
NATIONAL WEATHER SERVICE (CITY)(STATE)
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

(OVERALL AREA COVERED BY THIS FORECAST)
(SYNOPSIS UGC CODE)-(EXPIRATION TIME)-
.SYNOPSIS FOR (WFO MARINE AREA)...TEXT

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREAL DESCRIPTOR[S])
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)
REASON FOR UPDATE (or CORRECTION) (no ellipses)

...HEADLINE (*if necessary*)...
.Text

3.5 River Bar Forecasts. Bar forecasts are a segment of the CWF and are identified with their own unique Universal Generic Code (UGC). WR offices with specific marine zone codes for river bar forecasts are Seattle/Tacoma (Grays Harbor Bar), Portland (Columbia River Bar), and Eureka (Humboldt Bay).

3.6 Surf Zone Forecasts (SRF). Like river bar forecasts, not all WR coastal WFOs issue SRFs. SRFxxx is the standardized NWS identifier for products pertaining to life-threatening hazards in the surf zone. The surf zone is where waves interact with the bottom surface and break in relatively shallow water. Breaking wave heights, water level set up, and rip currents, are a few parameters WFOs can include in their SRFs. High surf and coastal flood events will be headlined at forecaster discretion. SRF content should be developed in coordination with local safety agencies who have responsibility for beachfront safety. Such agencies should be acknowledged in the product.

3.7 Combined Marine/Public Zones. Combined marine-public forecasts are not issued in WR.

3.8 Graphical Forecasts. WFOs will expand their marine weather information suite to include graphical forecasts using AWIPS IFPS/GFE. Effective implementation of graphical forecasts will involve customer outreach and education in order to determine what type of forecast information would be more useful in graphical format.

3.9 Marine Weather Statements (MWS). MWSs may be issued to provide details on non-severe weather conditions that affect marine operations for more than two hours.

- a. MWSs will be used to issue, update, and cancel High Surf Advisories. High Surf Advisories will be headlined in the CWF. High Surf Advisory criteria based primarily on wave height is listed in Appendix A.
- b. MWSs will be issued to cancel all or part of a Special Marine Warning (SMW), advise customers that an SMW has expired, or heighten awareness of the potential SMW hazard.
- c. MWSs may be used to inform customers of Small Craft Advisories for Hazardous Seas based on wave steepness. MWSs can be especially useful in this case to explain the hazards associated with high, short period waves.
- d. MWSs can be used to highlight significant weather predicted to occur beyond 24 hours from the current forecast period, i.e., as an outlook.

3.10 Effective Periods for Small Craft Advisories , Gale Warnings and Storm Warnings. The effective period for issuance of the above described products are as follow:

- a. Small Craft Advisories. Coastal WFOs will issue Small Craft Advisories when criteria are met for the first twelve hour period, and may issue Advisories for the second period when forecast confidence is high. In addition, WFOs may include a headline in the Coastal Waters Forecast such as “Small Craft Advisory Conditions Expected Tuesday” for the third and fourth periods of the product.
- b. Gale Warnings/Storm Warnings. Coastal WFOs will issue Warnings when criteria are met for the first and/or second twelve hour periods, and may issue Warnings for the third period when forecast confidence is high. In addition, WFOs may include a headline in the Coastal Waters Forecast such as “Gale (or Storm) Warning Conditions Expected Wednesday” for the fourth and fifth periods of the product.

APPENDIX A - Example

1. Criteria for High Surf Advisory according to location.

| <u>Location</u> | <u>Criteria</u> |
|---|--|
| Cape Flattery, WA, to Cape Shoalwater, WA: | Significant Wave Hgt 20 FT or higher |
| Cape Shoalwater, WA, to Florence, OR: | Swell energy flux greater than or equal to 100×10^4 j/ms. |
| Florence, OR, to Point St. George, CA: | Significant Wave Hgt 20 FT or higher |
| Point St. George, CA, to Point Arena, CA: | Significant Wave Hgt 18 FT or higher |
| Point Arena, CA, to Point Piedras Blancas, CA: | Significant Wave Hgt 15 FT or higher |
| Point Piedras Blancas, CA to Point Conception, CA | Significant Wave Hgt 10 FT or higher |
| Point Conception, CA, to the U.S.-Mexico border | Significant Wave Hgt 7 FT or higher |